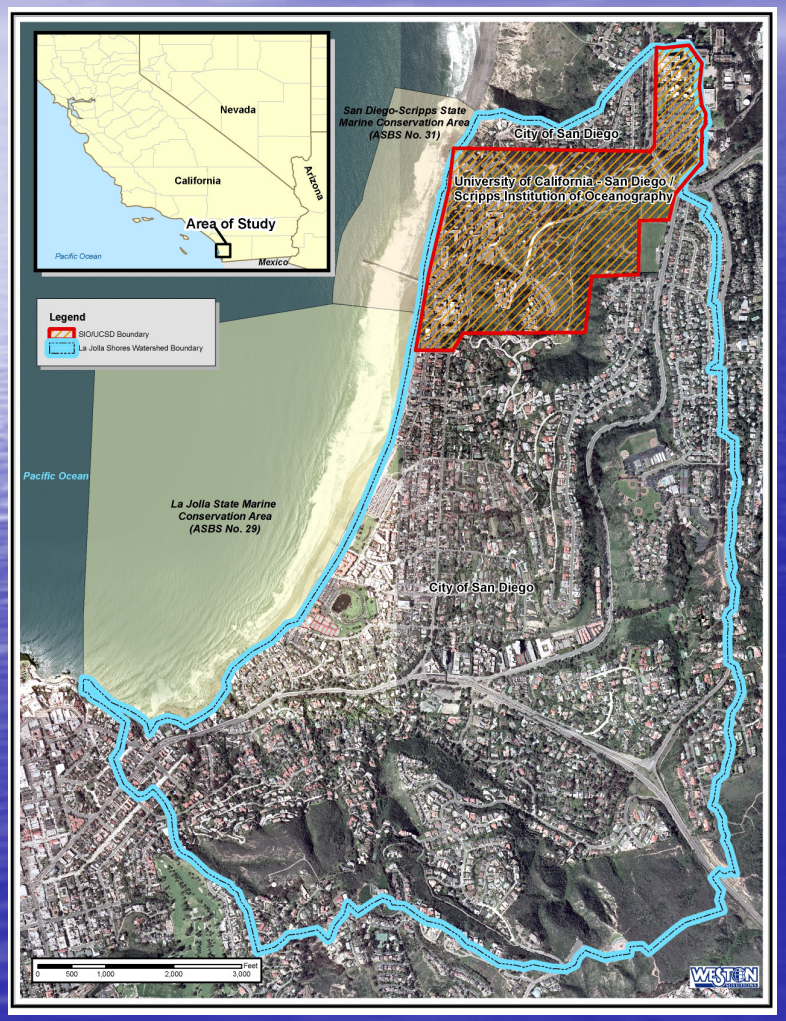
La Jolla Shores Coastal Watershed Management Plan and ASBS Protection Program

City of San Diego
San Diego Coastkeeper
Scripps Institution of Oceanography
University of California, San Diego

California NPS Conference May 6, 2008

Grant funding provided by SWRCB Proposition 50: IRWM and Coastal Nonpoint Source Pollution Control Program

La Jolla Shores ASBS Protection Program



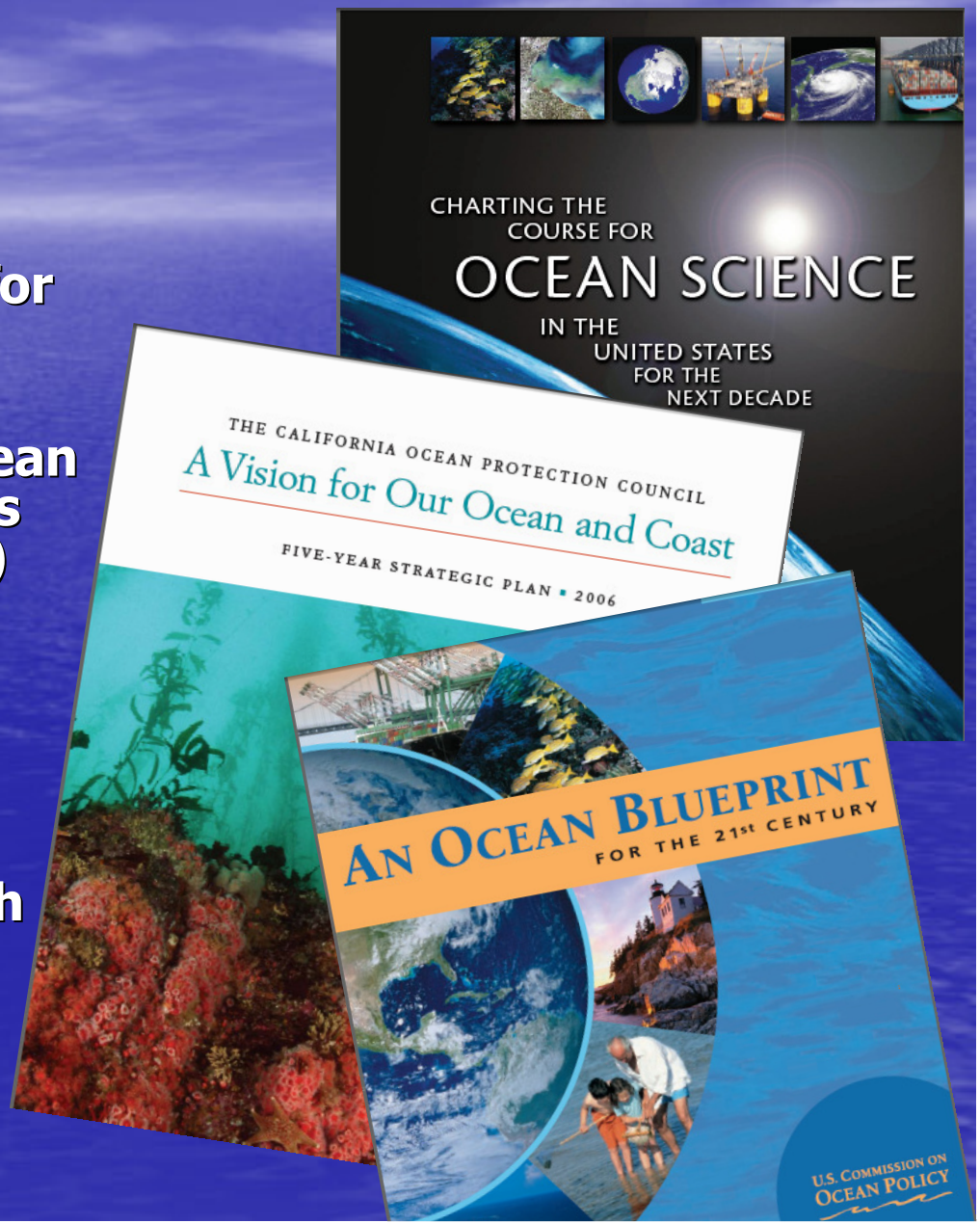
- Addresses two ASBS & contributing watershed
- Current Projects:
  - La Jolla Shores Integrated Coastal Watershed Management Plan
  - La Jolla Shores Dry Weather Flow and Pollution Control Program and Source Study
- Collaborative process with UCSD, SIO, City of San Diego and Coastkeeper

La Jolla Shores Coastal Watershed Management Plan

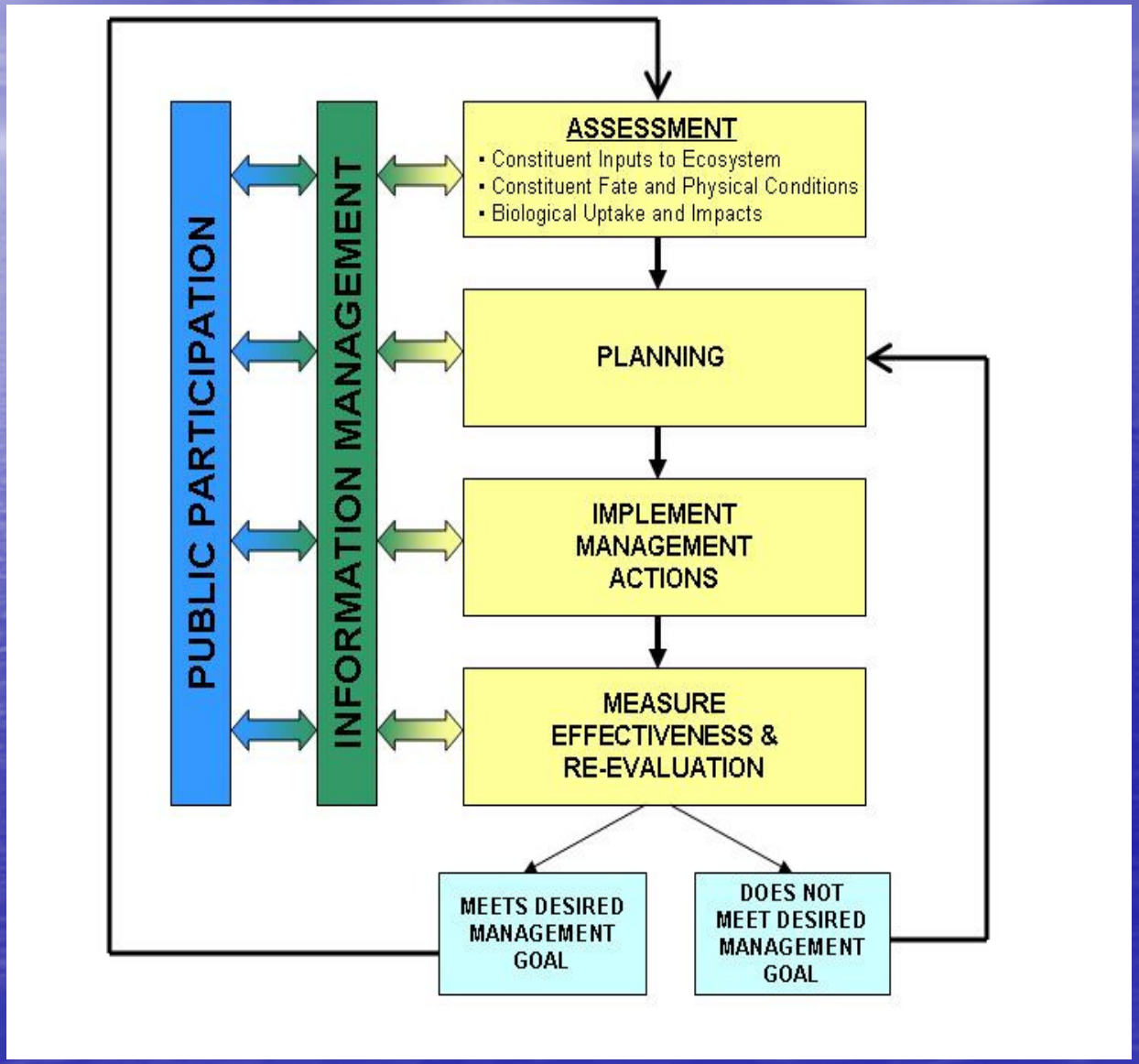
1. Urban Runoff Management
   - Characterize pollutants & sources
   - Develop BMPs to manage pollutants
2. Ocean Ecosystem Assessment
   - Recognize importance of an ecosystem focus
3. Information Management
   - Develop tools to use data
4. Public Participation & Outreach
   - Encourage ocean stewardship

ALIGNMENT WITH NATIONAL AND STATE EFFORTS

1. U.S. Commission on Ocean Policy An Ocean Blueprint for the 21st Century (2004)
2. Charting the Course for Ocean Science in the United States for the Next Decade (2007)
3. Ocean Protection Council Five-Year Strategic Plan
4. West Coast Governors' Agreement on Ocean Health
5. California Ocean Plan Regulatory framework for California's Oceans

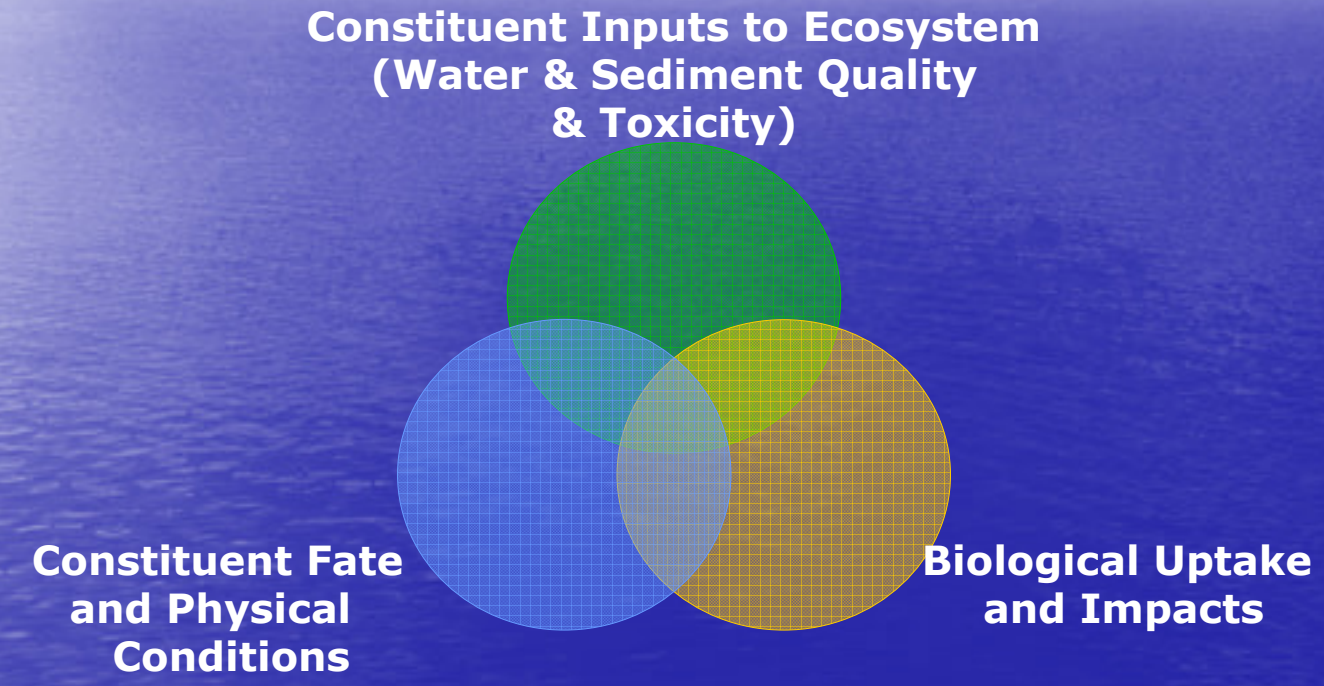


ASBS PROTECTION MODEL




Physical Conditions
San Diego Marine Life Refuge ASBS
San Diego-La Jolla Ecological
San Diego Marine Life Refuge
Dilution & Currents
Air Deposition
Storm Water
Biological Abundance & Diversity - Biomarkers
Sediment & Bioaccumulation
Urban Runoff
La Jolla Ecological Reserve
18
1
26
2
4
23
3
27
28
22
31
30
29
32
13
Feet
0
500
1,000
2,000
3,000

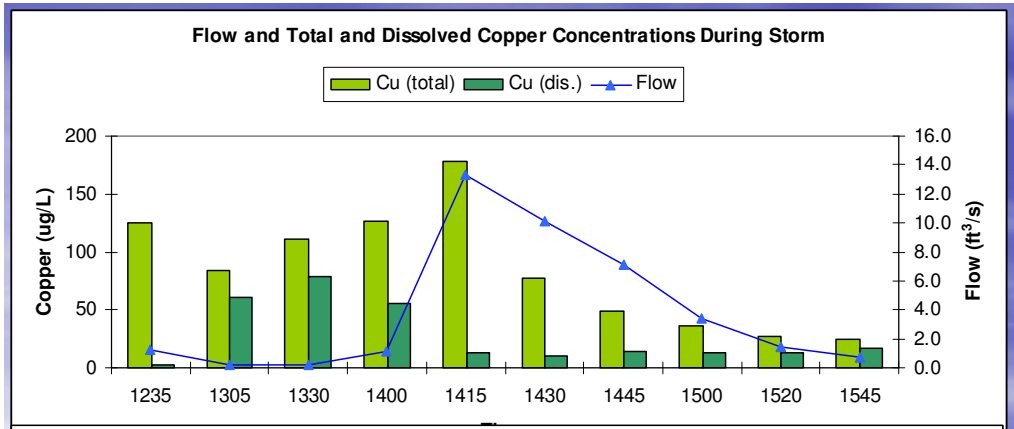
Step 1 - ASSESSMENT

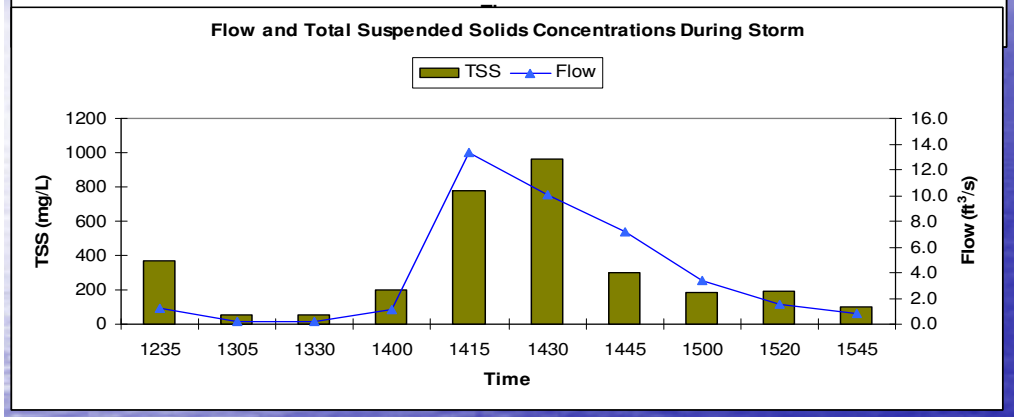


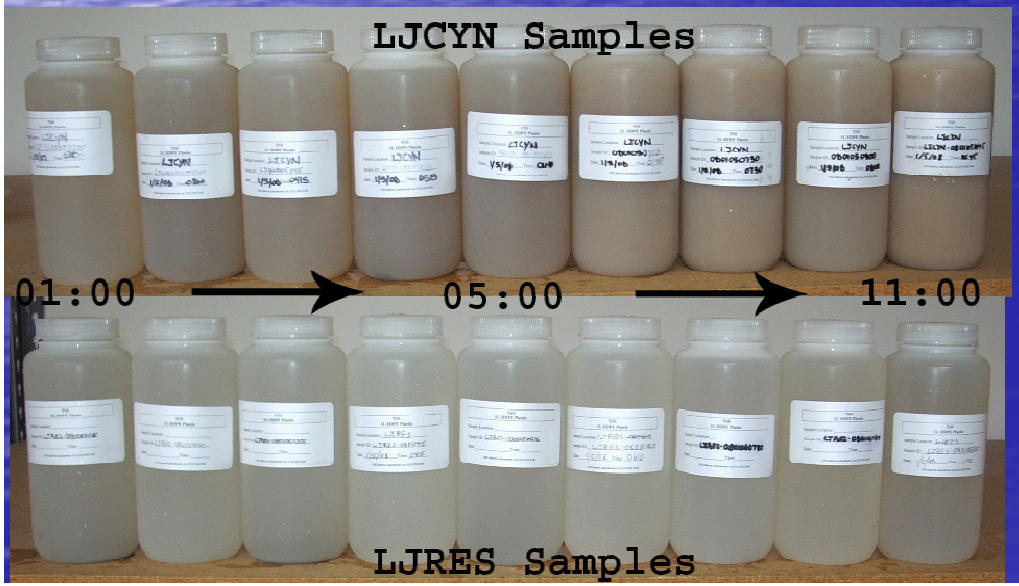
TRIAD APPROACH FOR POC IDENTIFICATION

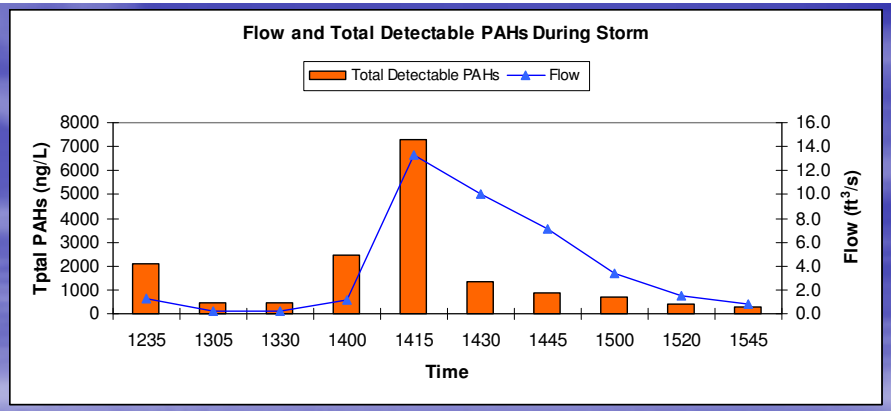
ASBS Triad Assessment

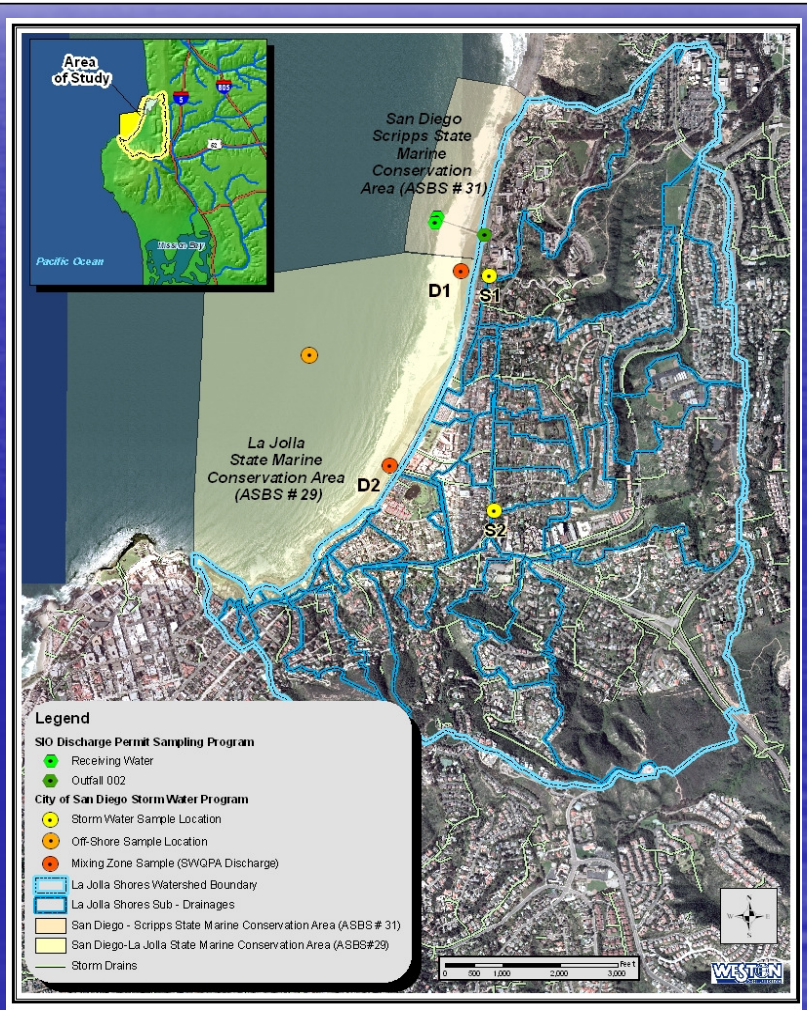
- Constituent Inputs to Ecosystem
  - Water Quality Assessment – Metals, Bacteria, Turbidity primary issues
  - Sediment Quality Assessment – Underway
  - Aerial Deposition Study – Underway
- Constituents Fate & Physical Conditions
  - Dilution Studies – rates up to 20 times
  - Current Studies – Dynamic currents
  - Habitat/Sediment Characterization – in development
- Biological Uptake and Impact
  - Toxicity Testing – Kelp germination effect
  - Bioaccumulation Testing – Cr, Ni, As Potential Metal Issues


Flow and Total and Dissolved Copper Concentrations During Storm
Cu (total)
Cu (dis.)
Flow
Copper (ug/L)
Flow (ft3/s)
200
150
100
50
0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1235
1305
1330
1400
1415
1430
1445
1500
1520
1545

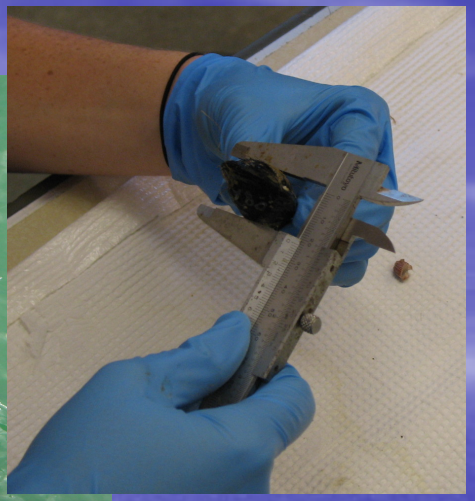

Flow and Total Suspended Solids Concentrations During Storm
TSS
Flow
TSS (mg/L)
Flow (ft3/s)
1200
1000
800
600
400
200
0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1235
1305
1330
1400
1415
1430
1445
1500
1520
1545
Time

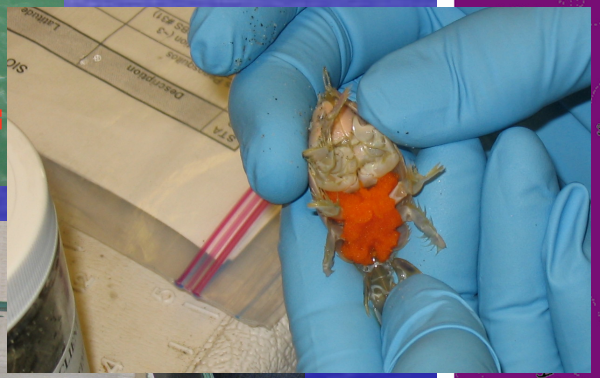

LJCYN Samples
01:00
05:00
11:00
LJRES Samples

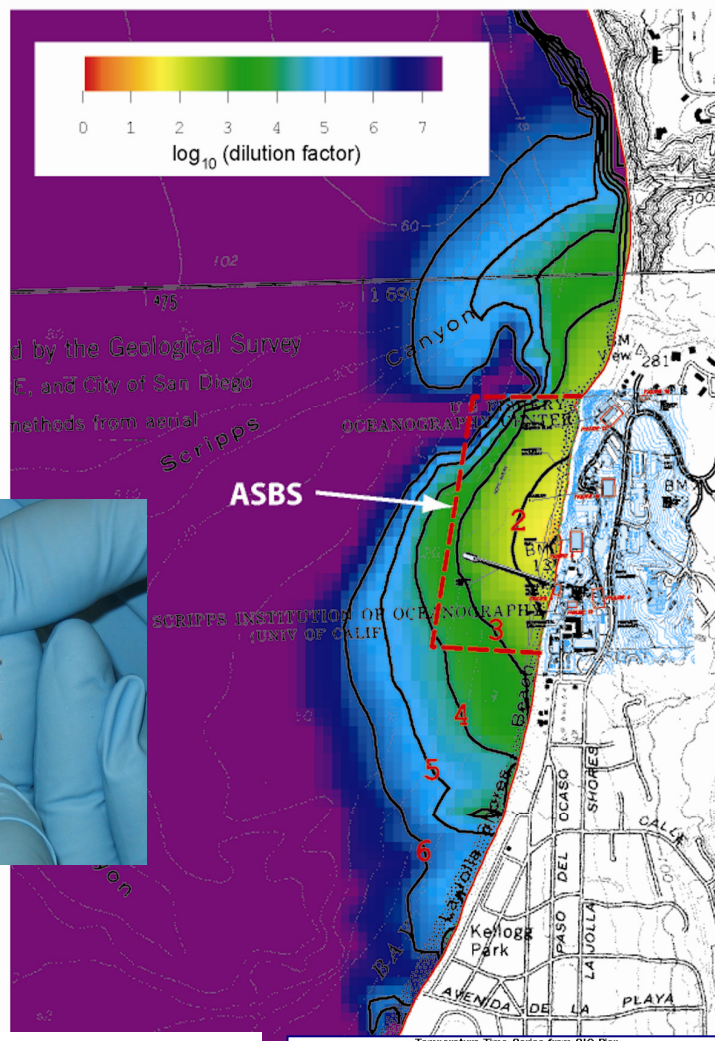

Flow and Total Detectable PAHs During Storm
Total Detectable PAHs
Flow
Tptal PAHs (ng/L)
Flow (ft3/s)
8000
7000
6000
5000
4000
3000
2000
1000
0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1235
1305
1330
1400
1415
1430
1445
1500
1520
1545
Time

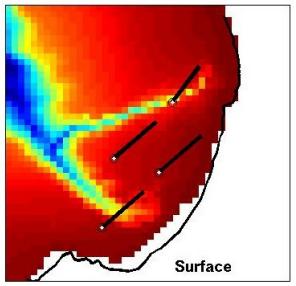

Area of Study
Pacific Ocean
San Diego Scripps State Marine Conservation Area (ASBS # 31)
La Jolla State Marine Conservation Area (ASBS # 29)
D1
S1
D2
S2
Legend
SIO Discharge Permit Sampling Program
Receiving Water
Outfall 002
City of San Diego Storm Water Program
Storm Water Sample Location
Off-Shore Sample Location
Mixing Zone Sample (SWQPA Discharge)
La Jolla Shores Watershed Boundary
La Jolla Shores Sub - Drainages
San Diego - Scripps State Marine Conservation Area (ASBS # 31)
San Diego-La Jolla State Marine Conservation Area (ASBS#29)
Storm Drains
WESTON

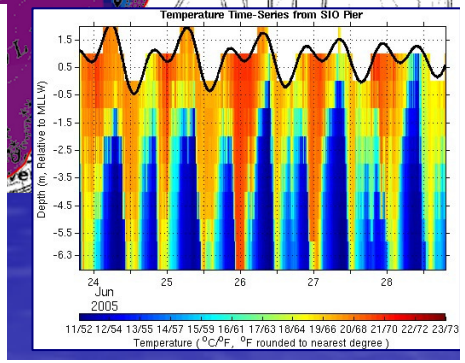

2006 8





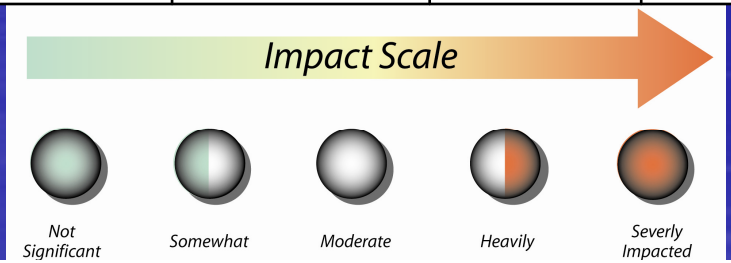

0 1 2 3 4 5 6 7
log10 (dilution factor)
ASBS
Scripps
OCEANOGRAPHIC
SCRIPPS INSTITUTION OF OCEANOGRAPHY
UNIV OF CALIF
Kellogg Park
AVENIDA DE LA PLAYA
LA JOLLA
1
2
3
4
5
6


Mode 1 Circulation
Surface


Temperature Time-Series from SIO Pier
Depth (m, Relative to MLLW)
1.5
0.5
-0.5
-1.5
-2.5
-3.5
-4.5
-5.5
-6.3
24
25
26
27
28
Jun
2005
11/52 12/54 13/55 14/57 15/59 16/61 17/63 18/64 19/66 20/68 21/70 22/72 23/73
Temperature (°C/°F, °F rounded to nearest degree)

La Jolla Watershed- High Priority Constituents

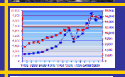
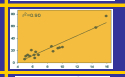
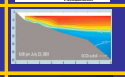
Pollutant	Priority	Potential Source(s)	Pollutant Pathway to ASBS	Expected Degree of Impact	Impacted Ecosystem Component	Data Gap
Metals (arsenic, copper, chromium, nickel)	High	Brake pad wear Commercial/industrial activities Residential activities	Aerial deposition Wet weather Dry weather Cross-contamination		Possible reduced growth of filter feeders	Source contribution study required to assess contribution via aerial deposition, urban runoff or cross-contamination
Turbidity (Sediment)	High	Erosion from development Landscaping Invasive species Minor disturbances Road debris Run-off from undeveloped open spaces Bluff erosion	Wet weather flow		Potential reduced algae recruitment and growth	Source identification and classification of sediment required to assess load contribution and potential beneficial use options
Bacterial Indicators	High	Pet waste Landscape activities Restaurant establishments Organic matter Birds	Wet weather flow Dry weather flow		Public health; Shellfish contamination	Source contribution study required to assess loading potential



Step 2 - PLANNING

- Identification and prioritization of management measures
  - Identification of impacts and degree of impact
  - Identification of potential sources of ecosystem impacts
  - Prioritization of management measures for identified pollutants of concern (e.g., metals, sediment, and bacteria) and highest level of impact
  - Compliance with Ocean Plan (restrictions on dry weather discharges & natural water quality for stormwater)

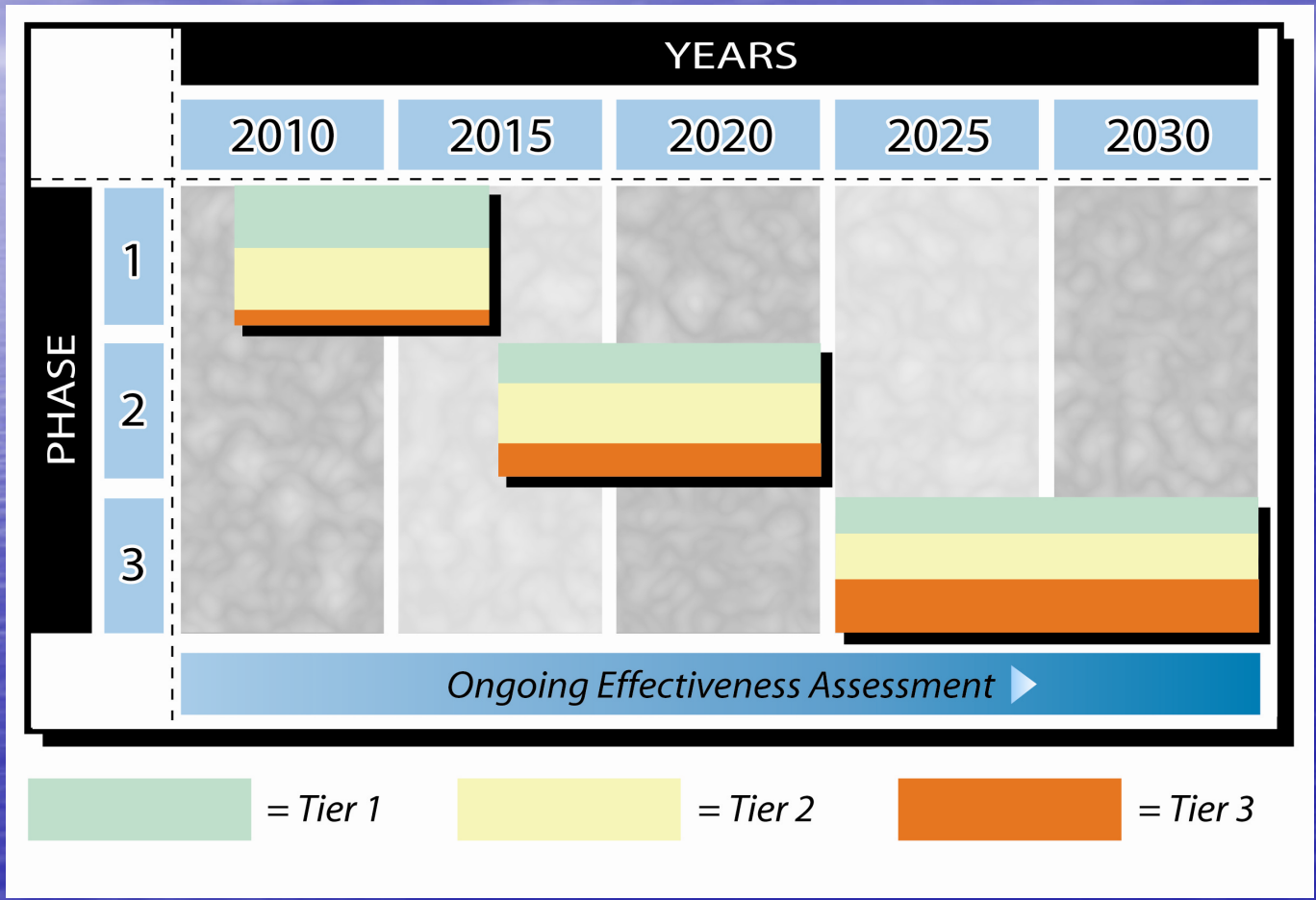
Planning – Prioritization of Measures
Ecosystem Impact Assessment
Partnership with City of Newport ASBS

	Indicator		Water Quality		Cross Contamination	Public Use	Seasonal Effects
			Wet	Dry			
Biotic	Mussel *Mytilus* spp.						
Biotic	Kelp *Macrocystis*						
Biotic	Rockweed *Silvetia* spp.						
Biotic	Sea stars *Asteroidea*						
Biotic	Limpet *Lottia* spp.						
Biotic	Green algae *Ulva* spp.						
Biotic	Brown algae Endocladia						
Abiotic	Species abundance						
Abiotic	Species diversity						
Abiotic	Trophic transfer potential						
Abiotic	Temperature						
Abiotic	Beach wrack						
	Overall Grade						

Step 3 - MANAGEMENT MEASURES

- BMP Prioritization and Implementation
  - Based on identified priority constituents and level of impact to ecosystem
  - Implementation using a Tiered Approach
    - Tier I – Non-structural Source Control and Pollution Prevention (Outreach and Enforcement)
    - Tier II – Runoff Reduction and Active Source Reduction (Street Sweeping, LID, Infiltration)
    - Tier III – Treatment (media filter, dry weather flow diversions, erosion and sediment controls)

Tiered and Phased Approach



Tier I – Source Control and Pollution Prevention Phase I

- Public Outreach – Urban Corps
- Source Controls (wash racks, trash enclosures, material storage areas, erosion control areas)
- Public Education – Community Based Social Marketing
- Increased Inspection of Restaurants
- Air Deposition and Sediment Source Studies

Public Outreach – Success to Project Implementation and Sustainability

Understanding Areas of Special Biological Significance.

The California State Water Resources Control Board created Areas of Special Biological Significance, where no pollutants are allowed to be discharged in order to help maintain high water quality within some of the most pristine and biologically diverse sections of California's coast. Today, there are 34 such areas—sometimes referred to as State Water Quality Protection Areas—in California. La Jolla is home to two. These ASBS encompass a large portion of the La Jolla Shores marine environment, which includes the La Jolla State Marine Conservation Area and the adjoining San Diego-Scripps State Marine Conservation Area.

www.sdcoastkeeper.org

Make a Difference...

You can also make a difference by embracing ocean stewardship in your daily life. As a resident, here are some steps you can take each day to improve La Jolla's coastal environment:

- Dispose of trash in proper receptacles
- Join a beach cleanup or pick up trash on your own
- Use a broom or wet mop instead of spraying or rinsing off your driveway or sidewalk
- Use cleaning products that contain less harmful compounds
- Keep your car in good repair to prevent oil or anti-freeze leaks
- Dispose of chemical wastes properly (follow the disposal instructions from your trash company)
- Keep informed of current events impacting our oceans through newspapers, internet or broadcast news

Working together, we can all make a difference in achieving a clean, healthy ocean environment at La Jolla Shores.

For more information on Areas of Special Biological Significance and The La Jolla Shores Coastal Watershed Management Plan, please visit **www.sdcoastkeeper.org.**

scripps.ucsd.edu

SAN DIEGO COASTKEEPER®

City of San Diego

"Funding for this project has been provided in full or in part through an Agreement with the State Water Resources Control Board (SWRCB) pursuant to the Costa-Machado Water Act of 2000 (Proposition 13) and any amendments thereto for the implementation of California's Nonpoint Source Pollution Control Program. The contents of this document do not necessarily reflect the views and policies of the SWRCB, nor does mention of trade names or commercial products constitute endorsement or recommendation for use."

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info@sdcoastkeeper.org.

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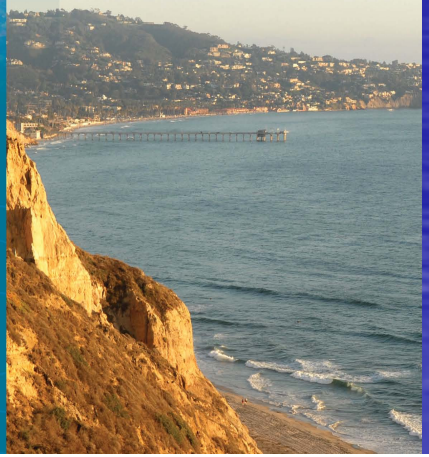
Areas of Special Biological Significance.

La Jolla, California

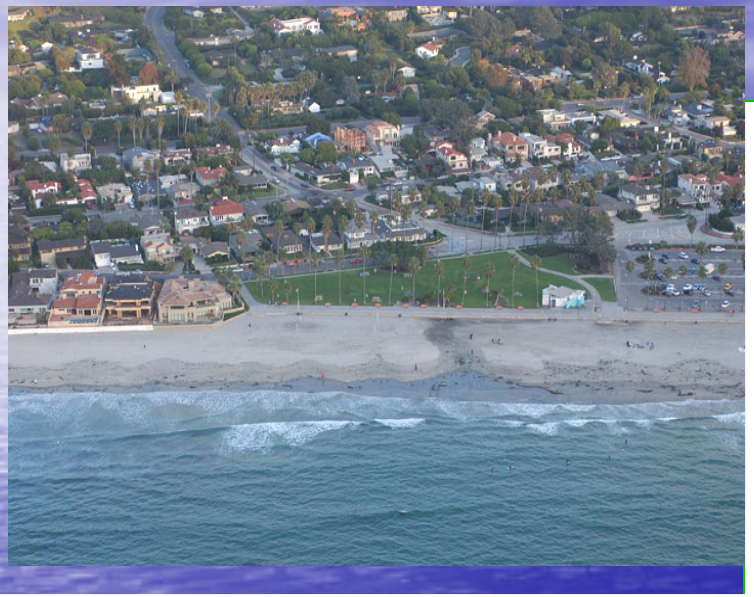
SAN DIEGO COASTKEEPER®

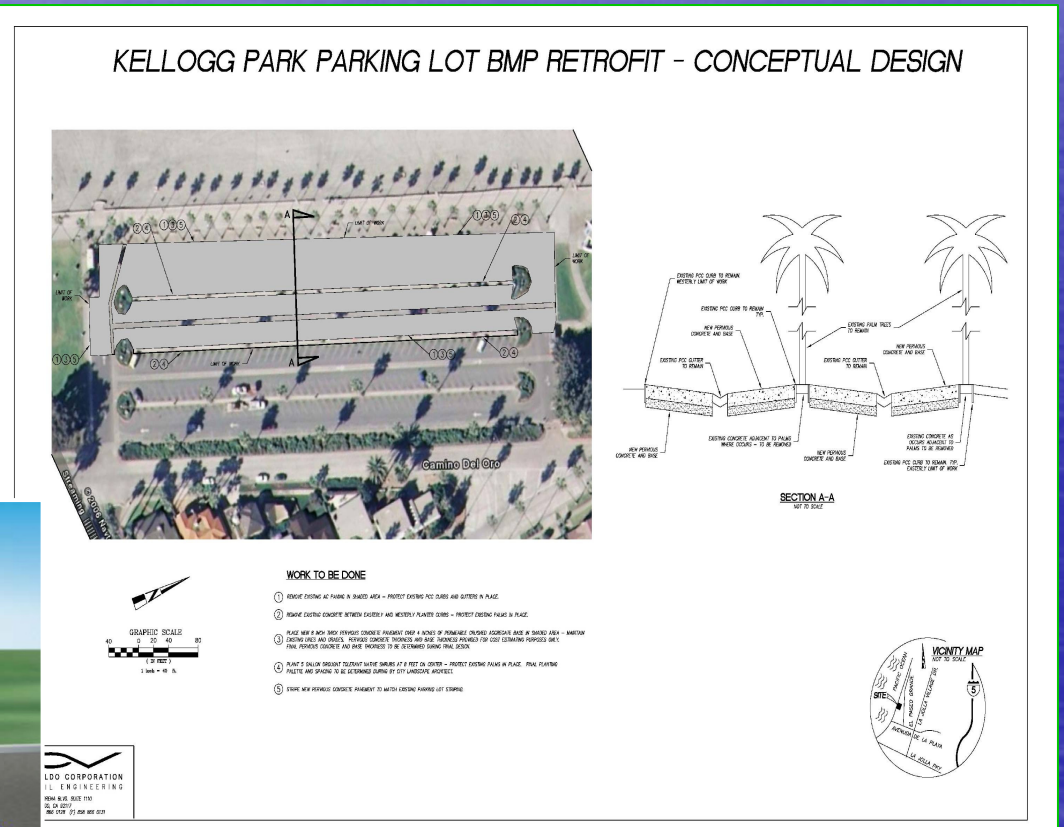
What's in your backyard?

As a resident of San Diego, you know that you live in one of the world's most beautiful coastal areas. Many of you have walked La Jolla's sandy beaches, fished off of local piers, sailed up the coast, or watched a brilliant sunset from the rocky coasts. You also probably know that the waters off the coast of La Jolla are home to a fantastic array of marine life. You may have seen some of these creatures—spiny lobsters, abalone, giant sea bass, vermillion rockfish, schools of leopard sharks—up close while wading, snorkeling or diving. Or maybe you were content to appreciate La Jolla's serene ocean beauty from shore. Regardless of how you choose to experience it, you know that this area is special. It's your own oceanic backyard. It's home. But did you know that this area was so ecologically significant—and so vulnerable to damage—that it is designated by the State of California as an Area of Special Biological Significance (ASBS)?

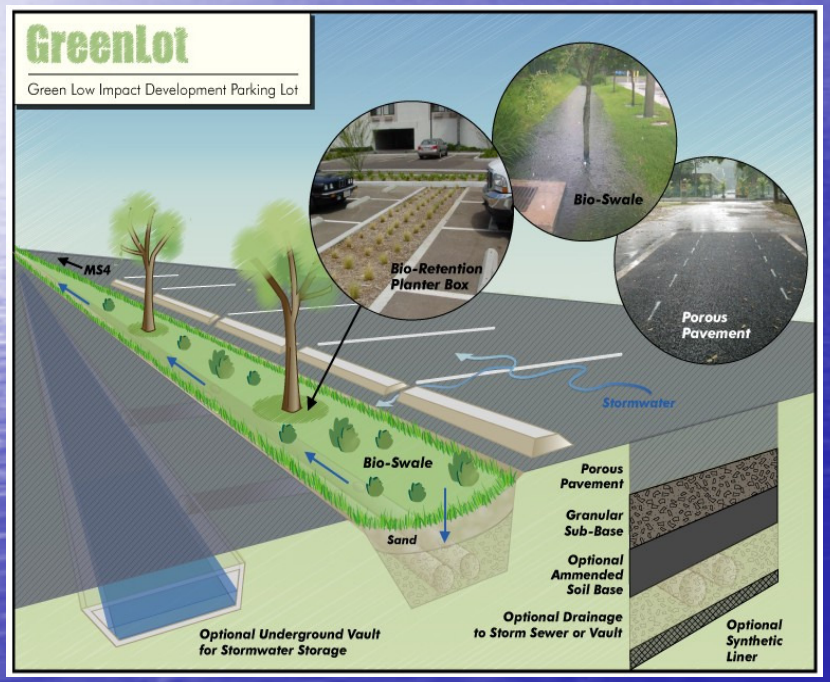


Tier II – Runoff and Pollutant Load Reduction - Phase I





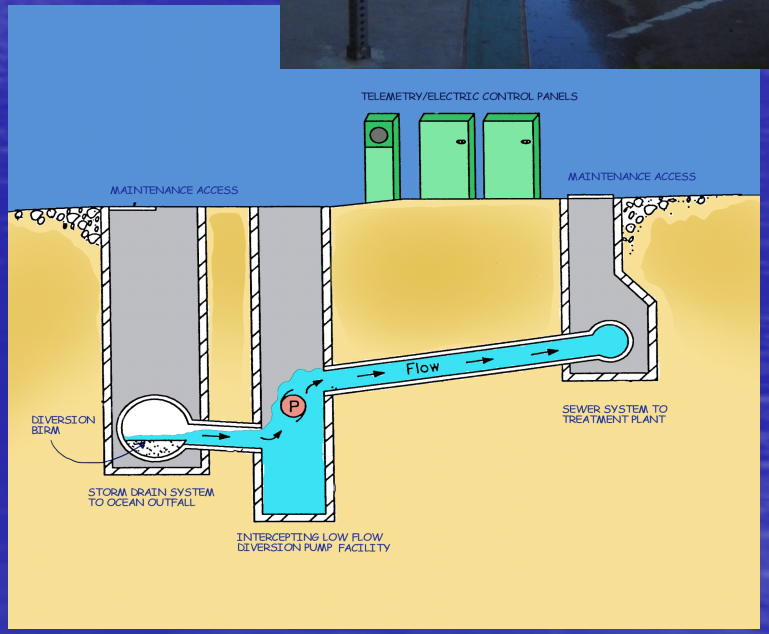
Tier II – Runoff and Pollutant Load Reduction - Phase I Projects in Planning Stage



- Complete Porous Pavement Kellogg Park
- Aggressive Street Sweeping
- Irrigation Improvements
- Biorentention Cell – Drought Tolerant Plantings

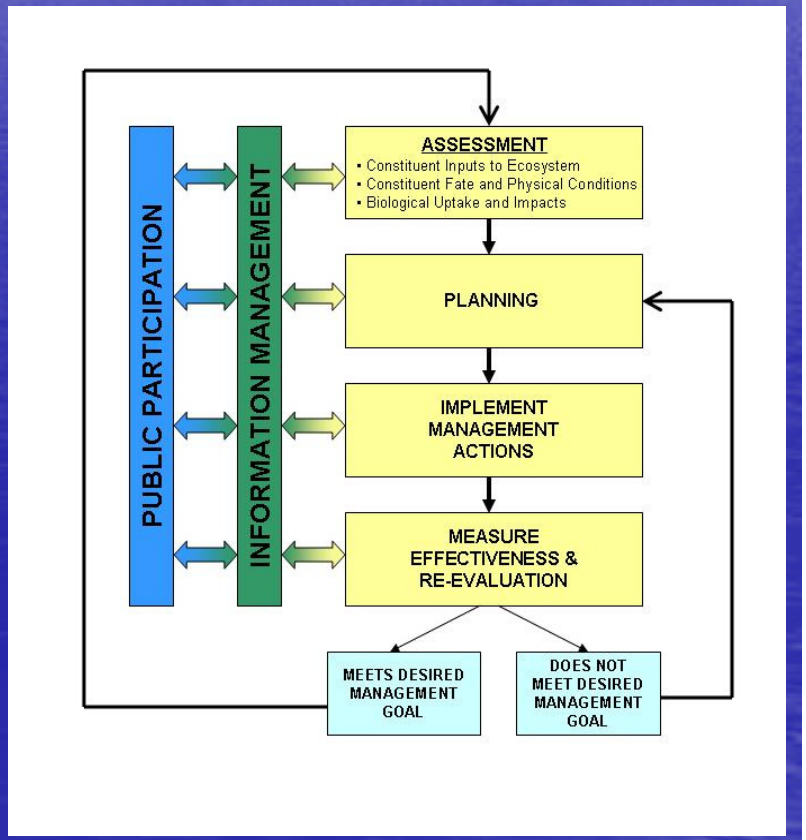
Tier III – Treatment – Phase I

- Dry Weather Flow Diversions – 2 additional in Phase II
- Erosion and Sediment Controls
- Pilot Treatment-Train Systems – Media Filter for Small Drainage Area
  - Cost/Benefit Analysis

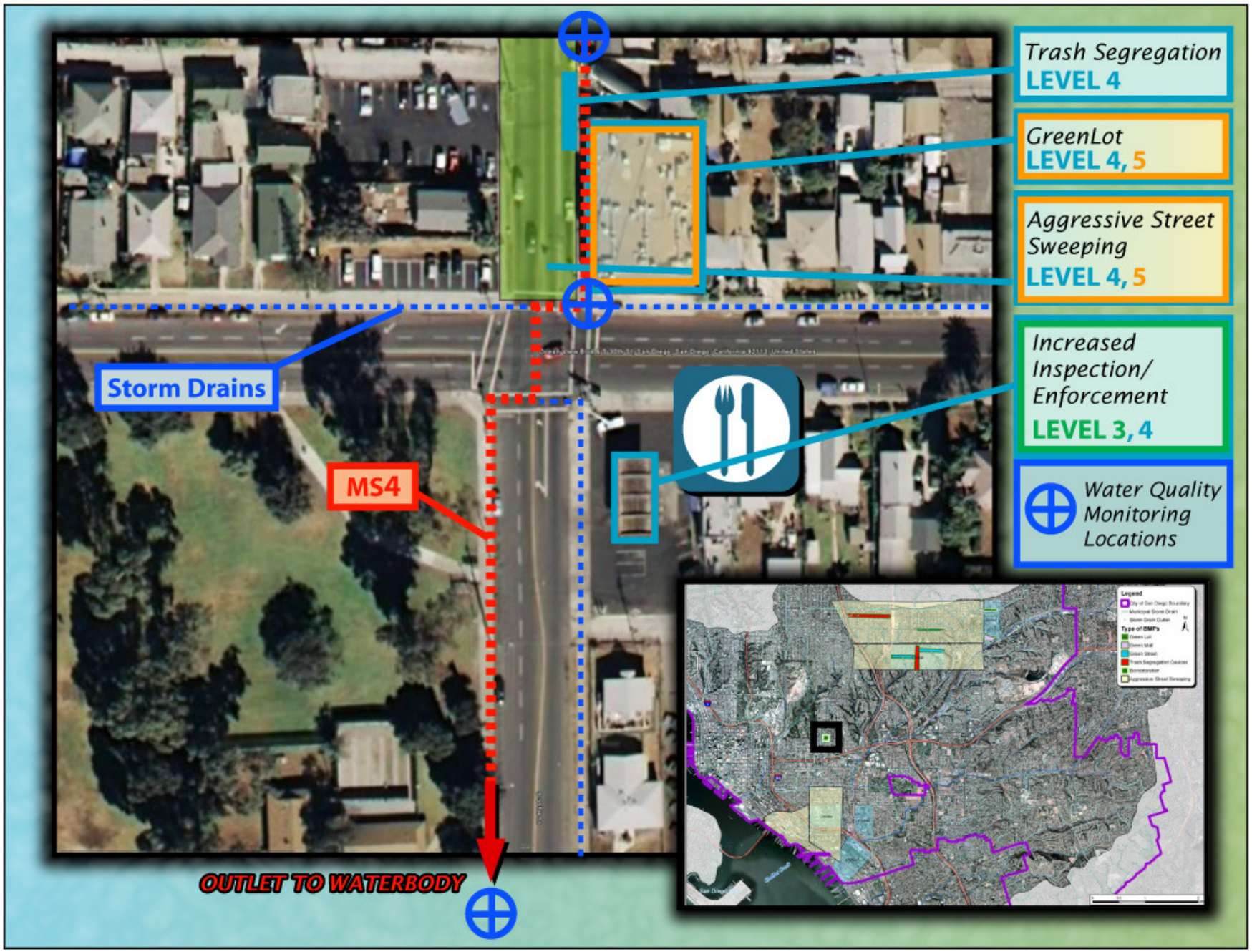


Step 4 - Effectiveness Assessment and Re-evaluation

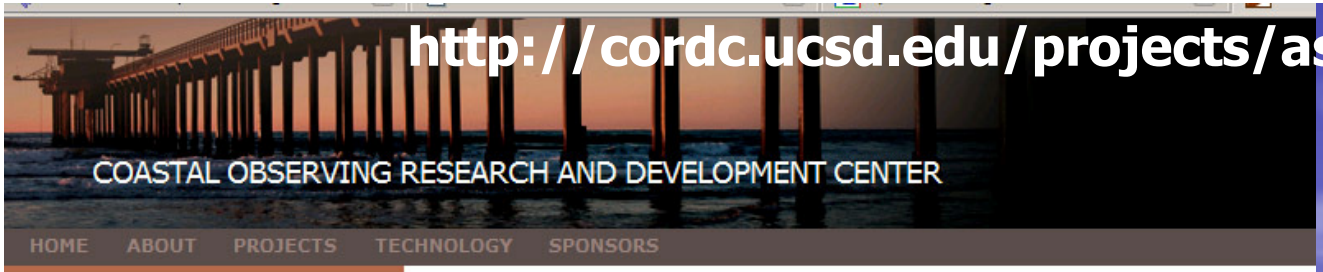
- Conduct Effectiveness Assessment Monitoring of BMPs
- Implement in Phased Approach based on Prioritization by Constituent and Source
- Based on Results Expand or Modify Management Actions
- Monitor Ecosystem for Impacts and Improvements



Effectiveness Levels



http://cordc.ucsd.edu/projects/asbs/waterquality.php



HOME ABOUT PROJECTS TECHNOLOGY SPONSORS

PROJECTS

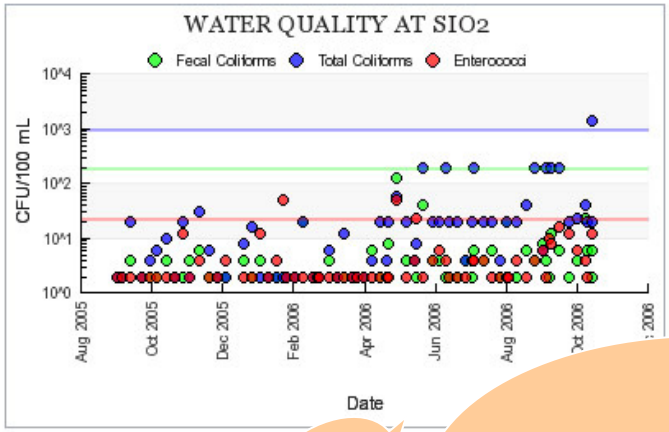
Surface Current Mapping (HF RADAR)
Tijuana River Plume Tracking
Pier Based Sensor Development
Hydrodynamics Experiments
Hurricane Profilers
Coastal Remote Sensing
Cabled Nearshore Sensors
Shoreline Water Quality
Areas of Special Biological Significance
Lightweight Coastal Moorings
Shallow Water Internal Waves
REMUS Operations
Dispursed Oil Tracking
San Diego Coastal Ocean Observing System
Southern California Coastal Ocean Observing System

ASBS DATA

Overview
Nearshore GIS
Documents
Bacteriological Data
Meteorological Data
Heavy Metals
Logs

Water Quality & Bacteriological Data

STATIONS
SIO1
SIO2
SIO3



STATION SIO2

Surf Zone, 250' south of SIO Pier , 32° 51.93' N 7° 15.30' W

Exceedances in the last 6 months of s ing

Fecal Coliforms: 0 (values below 200 /N/100 mL permitte

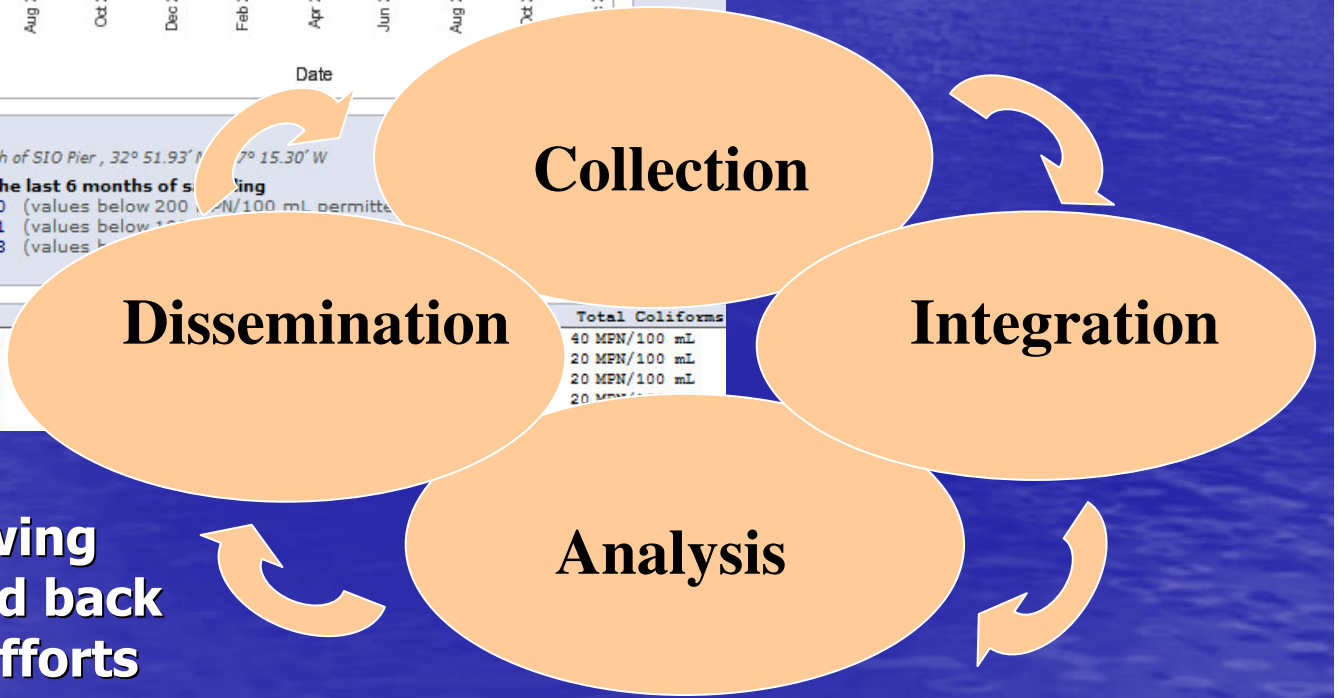
Total Coliforms: 1 (values below

Enterococci: 3 (values

Download data

Date	Total Coliforms
2005-03-03	40 MPN/100 mL
2005-03-08	20 MPN/100 mL
2005-03-14	20 MPN/100 mL
2005-03-22	
2005-03-28	

Ongoing Data/Information Management



Iterative process allowing new knowledge to feed back to future monitoring efforts

ASBS Protection Program – Next Steps

- Collaboration with regional ASBS Efforts
- Develop and Implement Ecosystem Assessment
- Complete Dry Weather Diversions
- Evaluate Effectiveness of Aggressive Street Sweeping coordinated with Air Deposition Studies
- Public Outreach – CBSM, Urban Corps, Signage and Educational Materials
- Expand Runoff Reduction Efforts
- ASBS Data Management System
- Assess Effectiveness of Measures

PROGRAM RECOMMENDATIONS & FUNDING NEEDS

- **Management Measures** - Implement BMPs within the watershed using a phased and tiered approach
- **Long-term ASBS Ecosystem Assessment** - Shift focus to ecosystem impacts and long-term
- **Information Management** (storage, analysis, and display of data) – Build out statewide ASBS system
- **Ocean Stewardship (Outreach)** - Focus on behavior change within watershed
- **Governance** - Maintain and Expand Partnerships

Continued and dedicated State funding is necessary to protect California's ASBS


Questions?